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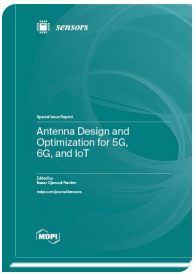
Special Issue Reprint

Antenna Design and Optimization for 5G, 6G, and IoT



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In the ever-evolving landscape of wireless communication, antenna design and optimization play a crucial role in enabling next-generation networks. As we transition from 5G to 6G and expand the Internet of Things (IoT), the demand for compact, efficient, and high-performance antennas continues to grow. Seamless connectivity, ultra-reliable low-latency communication (URLLC), and enhanced mobile broadband (eMBB) require innovative antenna solutions to meet diverse performance needs. Antennas now serve as key enablers of advanced wireless systems, influencing efficiency, reliability, and scalability. This Reprint explores advancements in antenna design for 5G, 6G, and IoT, covering multiple-input multiple-output (MIMO) systems, millimeter-wave (mmWave) and terahertz (THz) antennas, reconfigurable intelligent surfaces (RISs), beamforming, and AI-driven optimization. As networks adopt higher-frequency bands, materials such as graphene and metamaterials are revolutionizing performance, enabling dynamic beamforming, enhanced energy efficiency, and improved spectrum utilization. Additionally, IoT applications require miniaturized, flexible, and cost-effective antennas that operate across multiple frequency bands. From smart cities and autonomous vehicles to healthcare and industrial automation, this Reprint highlights cutting-edge methodologies, novel architectures, and the transformative potential of next-generation antenna technologies. These contributions provide a comprehensive overview of research shaping the future of wireless communication.

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